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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,215	07/18/2003	Raymond C. Chiu	56547US002	2866
32692	7590	08/09/2005	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY			SONG, SARAH U	
PO BOX 33427			ART UNIT	
ST. PAUL, MN 55133-3427			PAPER NUMBER	
			2874	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/623,215

Applicant(s)

CHIU ET AL.

Examiner

Sarah Song

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17, 19, 20 and 26-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19, 20 and 26-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION

1. Applicant's communication filed on May 25, 2005 has been carefully considered and placed of record in the file. Claim 14 has been amended. Claims 18 and 21-25 have been canceled. Claims 26-31 have been added. Claims 1-17, 19, 20 and 26-31 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1-3, 5, 6, 8, 12-14, 26-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyano et al. (U.S. Patent Application Publication 2003/0118270 previously relied upon) in view of Dragone et al. (U.S. Patent 5,926,586 previously relied upon) and Hong (WO 86/02171 previously relied upon).**

4. Regarding claims 1, 13, 14 and 31, Miyano et al. discloses a method of making a plurality of waveguide resonator devices, the method comprising, providing a first substrate 22 supporting a plurality of waveguides, providing a second substrate 23 supporting a plurality of waveguides, mounting or positioning a precursor resonator structure 21 between the first and second substrates with the precursor resonator structure extending across the waveguides and at a fixed separation from a plurality of waveguides. See Figure 6 and Paragraphs [0036]-[0037].

5. Miyano et al. does not expressly disclose the step of dividing or cutting the precursor resonator structure into a plurality of separate resonators or pieces, the precursor resonator structure being divided at locations between the waveguides.

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6. Dragone et al. discloses a known method of mass-producing an optical device comprising the steps of dividing (by cutting) a precursor structure into a plurality of separate structures, the precursor structure being divided at locations between the waveguides. See Figure 2.

7. Miyano et al. and Dragone et al. are analogous art as pertaining to optical waveguide circuits.

8. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Miyano et al. to further comprise the step of, after the precursor resonator structure has been positioned relative to the waveguides, dividing the precursor resonator structure 21 into a plurality of separate resonator structures, the precursor resonator structure being divided at locations between the waveguides.

9. The motivation for doing so would have been to provide ease of manufacturing for a multiplicity of identical devices.

10. Furthermore, Miyano et al. and Dragone et al. do not expressly disclose the method of providing spacer layers, or wherein the precursor resonator structure is positioned at a fixed spacing or separation relative to a plurality of sets of waveguides.

11. Hong discloses that the degree of coupling can be controlled by adjusting the spacing between a respective waveguide and a resonator structure.

12. Miyano et al. and Hong are analogous art as pertaining to waveguide resonators.

13. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to position the resonator structure at a fixed spacing or separation relative to the plurality of sets of waveguides of Miyano et al. It further would have been obvious to provide spacer layers to maintain said spacing as was known in the art.

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14. One of ordinary skill in the art would have been motivated to make the modification in order to optimize the degree of coupling and maintain the desired degree of coupling between the waveguide and resonator structure of Miyano et al. Resultantly, the step of cutting or dividing precursor resonator structure also results in cutting of the substrate, wherein each of the resonator devices includes a portion of each of the layers (i.e. substrate, precursor resonator structure, at least two of the waveguides and at least two of the spacer layers).

15. Regarding claim 2, the step of dividing disclosed by Dragone et al. comprises cutting. See column 2, lines 10-11.

16. Regarding claim 3, the step of cutting disclosed by Dragone et al. comprises mechanical cutting with an abrasive tool (i.e. circular saw). See column 2, lines 11-12.

17. Regarding claims 5 and 6, Miyano et al. discloses the precursor resonator structure to be elongated and cylindrical. See Figure 6.

18. Regarding claim 8, Miyano et al. and Dragone et al. do not expressly disclose cutting at a plurality of locations spaced apart along a longitudinal axis of the precursor resonator structure. However, the step of cutting at a plurality of locations spaced apart along a longitudinal axis of the precursor resonator structure would have been obvious in order to result in the multiplicity of identical structures as desired by mass production.

19. Regarding claim 12, Miyano et al. and Dragone et al. do not expressly disclose the steps of depositing waveguides on a substrate, and the step of depositing a spacer layer over the waveguides and securing the precursor resonator structure to the spacer layer.

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20. It is noted that the step of depositing waveguides on a substrate to form waveguides is well known in the art and would have been obvious in order to provide an efficient method of producing a plurality of waveguides simultaneously.

21. Hong discloses that the degree of coupling can be controlled by adjusting the spacing between a waveguide and a resonator structure.

22. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to deposit a spacer layer over the waveguides of Miyano et al.

23. One of ordinary skill in the art would have been motivated to make the modification in order to ensure that the desired degree of coupling is obtained and maintained between the waveguide and resonator structure of Miyano et al.

24. Furthermore, it is well known in the art to fix/secure components in order to prevent inadvertent movement between coupled components. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to fix the precursor structure adjacent to the waveguides of Miyano et al. in order to provide a more robust coupling arrangement.

25. Regarding claims 26 and 27, although not expressly disclosed, it would have been obvious to one having ordinary skill in the art at the time the invention was made to cut with straight cuts located between the waveguides since the waveguides of Miyano et al. are straight and further to provide ease of manufacture. Resultantly the cuts are generally perpendicular to a longitudinal axis of the precursor resonator structure.

26. Regarding claim 28, the spacer layer thicknesses are not expressly disclosed to be in the range of 0.05-2 microns. However, it would have been obvious to one having ordinary skill in

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the art at the time the invention was made to provide the claimed spacer layer since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. MPEP 2144.05(II)(A).

27. Regarding claim 29, the material of the spacer layers is not expressly disclosed as comprising silicon dioxide or fluorinated glass. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the claimed spacer layer since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. MPEP 2144.07.

28. **Claims 4 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyano et al. in view of Dragone et al. and Hong as applied to claim 1 or 14 as applicable above, and further in view of Ticknor (WO 03/036343 previously relied upon).**

29. Regarding claims 4 and 30, Miyano et al., Dragone et al. and Hong do not expressly disclose the abrasive tool to be a wire saw.

30. Ticknor discloses a wire saw for dividing an optical component.

31. Ticknor is analogous art as pertaining to an optical circuit.

32. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a wire saw as taught by Ticknor in order to provide a low-cost method.

33. **Claims 9-11, 15-17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyano et al. in view of Dragone et al. and Hong as applied to claim 1 or**

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14 as applicable above, and further in view of Sercel et al. (U.S. Patent Application Publication 2002/0037132 previously relied upon).

34. Regarding claims 9-11 and 15-17, Miyano et al., Dragone et al. and Hong do not expressly disclose the precursor resonator structure to be tubular, to include drawn glass or plastic, to include an optical fiber or a coated optical fiber, or to comprise a glass or plastic capillary.

35. Sercel et al. disclose a resonator structure comprising a coated optical fiber, which is also tubular or comprises a capillary. See Paragraphs [0105]-[0107]. It is further noted that optical fibers are typically comprised of drawn glass or plastic.

36. Sercel et al. is analogous art as pertaining to waveguide resonators.

37. Therefore; it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the optical fiber of Sercel et al. in the device of Miyano et al. in order to provide ease of alignment and assembly.

38. Regarding claims 19 and 20, Miyano et al. and Dragone et al. and Sercel et al. do not expressly disclose optical fibers coated with a material adapted to encourage bacterial growth, or a precursor resonator structure comprising a tube filled with a material having a refractive index that can be modified with an applied field. Such fibers are well known in the art and would have been obvious to one having ordinary skill in the art in order to provide an optical coupler with specialized functionality.

39. **Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyano et al. in view of Dragone et al. and Hong as applied to claim 5 above, and further in view of Sercel et al.**

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40. Regarding claim 7, Miyano et al., Dragone et al. and Hong do not expressly disclose the precursor resonator structure to be tubular.

41. Sercel et al. disclose a resonator structure comprising a coated optical fiber, which is a tubular structure. See Paragraphs [0105]-[0107]. It is further noted that optical fibers are typically comprised of drawn glass or plastic.

42. Sercel et al. is analogous art as pertaining to waveguide resonators.

43. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the optical fiber of Sercel et al. in the device of Miyano et al. in order to provide ease of alignment and assembly.

Response to Arguments

44. Applicant's arguments filed May 25, 2005 have been fully considered but they are not persuasive. Applicant states that there is no suggestion to create multiple resonators from the resonator structure of Miyano et al. Examiner respectfully disagrees. Miyano et al. clearly creates multiple resonators from the resonator structure 21. Miyano et al. does not teach separating the multiple resonators from one another. However, Dragone et al. teaches division of multiple optical devices from an arrayed device to create individual devices. As shown by Dragone et al., separation of an array of devices to create individual devices is well known in the art, especially for the purpose of mass production. Therefore, the knowledge readily available to one of ordinary skill in the art provides the motivation to divide the integrally arrayed device of Miyano et al. into a plurality of individual devices.

45. In response to applicant's argument that that Dragone et al. discloses cutting of a substrate (and not an optical element) and cutting along curved lines to avoid cutting of the optical

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elements, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Dragone et al. is relied upon for the basic teaching of dividing individual components from an arrayed device for producing identical individual components.

Conclusion

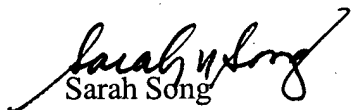
46. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,873,769 to Miyano et al. is the published patent of U.S. Patent Application Publication 2003/0118270 relied upon in the rejections above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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